REMARKS

This amendment is filed in response to the Office Action dated September 26, 2006 in which claims 5, 17, 27-30, 36 and 57-60 were rejected. Claims 6-14, 18-26, 31-35, 37-56 and 61-63 have been withdrawn from consideration. Claims 5, 17 and 27-29 are hereby amended to more clearly describe the invention as claimed. Claims 36 and 57-60 are hereby cancelled without prejudice or disclaimer. New claims 64-66 are added. Reconsideration and allowance of the pending claims is requested.

Section 112 Rejections

Claim 28 was rejected under 35 U.S.C § 112, second paragraph. It was stated in the Office Action that claim 28 was indefinite for referring to the entry of a maximum travel value in units of voltage rather than units of distance. Claim 28 has been amended to clarify that the value entered in step (a2) is in units of voltage, where the voltage units correspond to the position of maximum linear travel of the position sensor within its calibrated full-scale range. Thus, it should be appreciated that although the position sensor is used to measure a movement distance, its output is a voltage value that corresponds to the movement distance. Reconsideration and allowance of claim 28 is requested.

Section 102 Rejections

Claims 27 and 29-30 stand rejected under 35 USC 102(b) as anticipated by a user manual for the Acces Model LVDT-8, which is a circuit card that provides power, excitation voltages and analog signal conditioning for one or more linear variable differential transducers (LVDTs).

Before discussing the specific claim rejections, it may be helpful to consider some general but significant differences between the calibration procedure set forth in claim 27 and a calibration procedure described in the Acces manual. First, claim 27 as amended describes a computer-implemented procedure wherein *all* of the steps are performed by a computer processing device of a hardware monitoring apparatus. In contrast, the steps described in the Acces document are performed manually. Although the Acces document makes reference to an "LVDTSET" setup program running on an XT or AT claim computer, the only apparent function of the computer program is to display voltage values that are output from the LVDT. (See Acces manual, page 5-1, step numbers 2, 4, 5, 6 and 8.) The Acces manual does not describe steps performed automatically by a computer processing device, such as setting gain values, setting offset values, recording voltage levels, identifying linear

regions of operation or displaying prompts to instruct a user to move a position sensor to various positions.

With reference now to the specific limitations of claim 27, step (a) calls for receiving maximum scale information at a processing device, where the maximum scale information is entered by a user to indicate a maximum range over which the position sensor is to be used. The Acces manual does not describe or suggest any procedure whereby a user can enter a maximum scale value, or any other value, into a processing device. Therefore, the Acces manual does not provide step (a) of claim 27.

Step (b) calls for automatically setting a gain to an initial value based on operations performed by the processing device. The Acces manual does not describe any operations performed by a processing device to automatically set a gain value. Rather, the Acces manual instructs a user to select a gain setting by manually placing a jumper in one of two different positions. (Page 5-1, step 1.) The Acces manual does not suggest any need for or benefit of setting an initial gain value automatically. Thus, the Acces manual does not provide step (b) of claim 27.

Step (c) of claim 27 calls for automatically setting an offset to an initial value based on operations performed by the processing device. The Acces manual does not describe any operations performed by a processing device to automatically set an offset value. Rather, the Acces manual instructs a user to manually adjust a pot. (Page 5-1, step 2.) Again, the Acces manual does not suggest any need for or benefit of setting an initial offset value automatically. Therefore, the Acces manual does not provide step (c) of claim 27.

Step (d) calls for automatically displaying information on the display device of the hardware monitoring apparatus to prompt the user to cause the position sensor to traverse its complete range of movement. The Acces manual provides no description of any such prompt displayed on a display device. Thus, the Acces manual does not provide step (d) of claim 27.

Steps (e) and (f) call for recording minimum and maximum voltages produced by the position sensor as the complete range of movement of the position sensor is traversed. According to steps (e) and (f), the recording of the minimum and maximum voltages is performed automatically based on operations performed by the processing device. The Acces manual does not describe recording any voltage values, either automatically or manually. Although positioning an LVDT to maximum positive and negative displacements is a part of the calibration process described in the Acces

manual, there is no description or suggestion of recording the voltages produced by the LVDT at those positions. Therefore, the Acces manual does not provide steps (e) or (f) of claim 27.

Step (g) calls for identifying a substantially linear region of operation of the position sensor based at least in part on the recorded minimum and maximum voltages. According to claim 27, this identifying step is performed automatically based on operations performed by the processing device. The Acces manual does not describe any computer-implemented process for identifying a linear region of operation of a position sensor based on recorded minimum and maximum voltage values. The portion of the Acces manual cited in support of the rejection (page 3-4, line 12) merely mentions that an LVDT typically has a linear range (such as 0.025 inch). This passage says nothing about automatically identifying a linear range of operation based on previously recorded values. Thus, the Acces manual does not provide step (g) of claim 27.

Step (h) calls for automatically displaying information on the display device to prompt the user to locate the position sensor to operate at a point within the linear region of operation. As discussed above, the Acces manual does not describe or suggest displaying prompts to a user on a display device. Therefore, the Acces manual does not provide step (h) of claim 27.

Step (i) of claim 27 calls for setting the offset to a substantially zero value while the position sensor is operating within the linear region of operation. According to claim 27, this offset setting step is performed automatically based on operations carried out by the processing device. The Acces manual does not describe or suggest having a processing device automatically set an offset to zero. Rather, the offset adjust step described at page 5-1 of the Acces document is a manual process performed using an Offset Adjust pot. Thus, the Acces manual does not provide step (i) of claim 27.

Step (j) calls for automatically displaying information on the display device to prompt the user to locate the position sensor to operate at a maximum desired position within the linear region of operation. Again, the Acces manual does not describe or suggest displaying prompts to a user on a display device. Therefore, the Acces manual does not provide step (j) of claim 27.

Step (k) calls for automatically setting the gain to a known reference value while the position sensor is operating at the maximum desired position within the linear region of operation. This gain setting step is performed based on operations performed by the processing device. The Acces manual does not describe or suggest having a processing device automatically set a gain to a known reference value. Instead, the gain adjust step described at page 5-2 of the Acces document is also a

manual process performed using a gain-adjust pot. Thus, the Acces manual does not provide step (k) of claim 27.

In summary, not a single one of the calibration steps recited in claim 27 is described or suggested in the Acces manual. Accordingly, claim 27 patentably defines over the procedure described in the Acces manual. Reconsideration and allowance of claim 27 is requested.

Claims 28-30 depend on claim 27 and define additional important aspects of the invention. Therefore, Applicants submit that claims 28-30 patentably define over the Acces manual for at least the same reasons as set forth above for claim 27. Consideration and allowance of claims 28-30 is requested.

Section 103 Rejections

Claims 5 and 17 stand rejected under 35 USC 103(a) as unpatentable over U.S. Patent No. 5,248,248 to Adly in view of U.S. Patent No. 6,362,768 to Younis et al. and U.S. Patent No. 5,470,218 to Hillman et al., and further in view of the Acces manual. For the reasons set forth below, Applicants respectfully submit that the cited references in combination fail to teach or suggest the inventions of claims 5 and 17.

In claim 5 as amended, a processing device performs steps for calibrating a position sensor. Claim 17 as amended is directed to a method for calibrating a hardware monitoring device for use with a position sensor. In claims 5 and 17, the calibration steps are substantially the same as those recited in claim 27, except the steps of claims 5 and 17 are directed specifically to an LVDT position sensor. Accordingly, for the same reasons as set forth above in the discussion of claim 27, Applicants submit that the Access manual does not describe or suggest the calibration steps (a1)-(a11) recited in claim 5 or the calibration steps (b1)-(b11) recited in claim 17.

In the Office Action of October 7, 2005, it was stated that claims 5 and 17 were allowable over the prior art of record (including Adly, Younis and Hillman) because the art of record did not disclose performance of the claimed calibration steps in combination with the remaining claimed structure. Thus, it has already been established that Adly, Younis and Hillman in combination do not disclose or suggest the LVDT calibration process set forth in claims 5 and 17.

Accordingly, since the combination of Adly, Younis and Hillman do not describe the LVDT calibration steps, and the Acces manual does not describe the LVDT calibration steps, it follows that

the combination of Adly, Younis, Hillman and the Acces manual does not provide the invention of claims 5 and 17. Applicants request reconsideration and allowance of claims 5 and 17.

New Claims

New claims 64-66 are directed to calibration methods applicable to a dc sensor, a differential sensor and a current sensor as described in paragraphs [0032]-[0034] of the specification and Figures 13-15. As with the claims directed to the LVDT calibration, these claims emphasize the flexibility and automatic operation of the flexible process optimizer. These new claims, which introduce no new matter to the application, are directed to calibration methods that fall within the same class and subclass (702/104) as the LVDT calibration methods of claims 5, 17 and 27. Applicants submit that claims 64-66 also patentably define over the prior art of record.

In light of the foregoing discussion of the claims of the invention and the cited references, Applicants respectfully submit that a full and complete response to the Office Action is provided herein, and that all of the pending claims are now in condition for full allowance. Action in accordance therewith is requested.

If the Examiner identifies further issues that may be resolved by telephone, the Examiner is invited to contact the undersigned at (865) 546-4305.

In the event this response is not timely filed, Applicants hereby petition for the appropriate extension of time and request that the fee for the extension along with any other fees that may be due with respect to this paper be charged to our Deposit Account No. 12-2355.

Respectfully submitted,

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